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October 21, 2003

VIA HAND DELIVERY

Marlene H Dortch, Esq
Secretary
Federal Communications Commission
445 12th Street, S W , Room TW-A325
Washington, D C 20554

Re: Improving Public Safety Communications in the 800 MHz Band, WT Docket No. 02-55, Ex Parte Filing

Dear Ms Dortch

We represent Southern LINC ("Southern"), a CMRS provider that operates a digital SMR system in the 800 MHz band Southern has been an active participant in this proceeding and is a signatory to the Balanced Approach, a proposal for resolving interference to 800 MHz public safety licensees that focuses on local solutions to these local problems Southern is filing this letter to express its belief that the Consensus Plan, the other primary proposal before the Commission, would not significantly benefit all areas of the country despite the fact that it would involve a nationwide realignment of the 800 MHz band Southern's position is illustrated by the City and County of Denver

The City and County of Denver (collectively referred to herein as "Denver") have gone on record in this docket in support of the Consensus Plan [1] However, a report they filed on June 11, 2003, entitled "Cellular Radio Interference to Denver's 800 MHz Public Safety Network" ("*Report*") actually demonstrates that localized solutions have been effective in resolving most of the interference and that additional localized solutions could be applied to resolve the few remaining cases Based on Southern's review of the facts as stated in the Report, broad realignment of the 800 MHz band, as contemplated in the Consensus Plan, would not be of significant help to these few remaining cases of interference [2]

[1] Ex Parte Filing of City and County of Denver dated May 14, 2003

[2] Ex Parte Filing of City and County of Denver dated June 11, 2003 ("*Report*")

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A Local Solutions Have Resolved Most of the Problems

According to the *Report*, Denver initially experienced interference at twenty-four locations [3] Nextel Communications and Denver successfully implemented local, technical fixes (such as changing control channels and installing autotune cavity combiners) that resolved interference at all but "several" locations.[4] Significantly, the *Report* noted that so long as the control channels on Denver's EDACs radio system are free from interference, a call will eventually connect even if the first assigned voice channel is unusable because the system controller sequentially steps up in channel with each push-to-talk Thus, even though Nextel determined, for reasons that are not stated in the *Report*, that it was "not practical" for it to avoid interference to all of Denver's public safety voice channels, Denver assigned its control channels to some of the lowest frequencies for which it was licensed (*i e* , in the 854-859 MHz range) [5]

From statements included in the *Report*, it appears that third-order IM products have been the main interference problem for Denver Moreover, because the *Report* attempts to demonstrate that the Cellular A-band carrier is at least partly responsible for interference to Denver's channels in the interleaved portion of the band, it is highly likely that such interference would be the result of receiver IM and not OOBE In any event, it is apparent that the parties have been able to solve most of the interference through localized solutions, and, as discussed below, Denver's technical consultant has recommended that with additional localized solutions the few remaining problems can be resolved as well [6]

B Rebanding Will Not Significantly Reduce the Remaining Interference to Denver's Voice Channels

The *Report* specifically discusses five locations with remaining problems at which Nextel and the Cellular A-band carrier have transmitters that are in close proximity [7] The question thus becomes whether the Consensus Plan's complicated, expensive, and burdensome band realignment would eliminate interference at the five locations where technical fixes have not yet been applied Based on Southern's review, it does not appear that realignment would have a greater likelihood of resolving interference at these sites

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[3] *Report* at 2

[4] *Report* at 2-5

[5] *Report* at 5

[6] *Report* at 12

[7] *Report* at 5 Denver has reported more recently that there were 6 sites with continuing problems, but it has not provided information on what the problem was with the 6th site or how interference was corrected at that site

Denver has twenty-four frequencies for voice communications [8] Four of those are within the NPSPAC band (866-869 MHz), three are located within 859-861 MHz, and seventeen are located between 854-859 MHz.[9] Pursuant to the Consensus Plan's realignment scheme, the four NPSPAC channels would be relocated to the proposed new NPSPAC band at 851-854 MHz, the three 859-861 MHz channels could be relocated to 854-859 MHz, and the seventeen channels currently between 854-859 MHz would *not* be relocated at all

According to the *Report*, laboratory measurements of Denver's portable and mobile receivers showed that receiver overload is a "minor problem" and the "dominant problem" is receiver intermodulation (IM) [10] Southern acknowledges that moving Denver's four NPSPAC channels to the bottom of the 800 MHz band, well away from Cellular A&B Band frequencies, would decrease their susceptibility to IM interference caused by contributions from cellular transmissions exclusively However, Denver's three channels currently between 859-861 MHz would move only marginally farther down the band, and the seventeen channels currently within 854-859 MHz would not move at all. Although Nextel would be deinterleaved from the 854-859 MHz portion of the band, Nextel would retain its current spectrum holdings in the 861-866 MHz portion of the band, where more than half of Nextel's transmitters currently operate.[11] In addition, although the Report attempts to implicate the Cellular A-band carrier as a contributor to interference in Denver, the Consensus Plan would not require cellular carriers to relocate channels.

Southern's analysis indicates that realignment would not appreciably reduce the likelihood of IM interference in the few remaining locations where Denver has experienced interference. Even with rebanding, numerous combinations of IM "hits" would still be possible By Denver's own calculations, 530 theoretical IM hits could fall on Denver's 5 control channels in the interleaved portion of the band from one of the sites where Nextel is collocated with the Cellular A-Band carrier [12] If Denver had also considered its voice channels, the number of IM hits would have been that much greater. It would appear that a

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[8] *Report* at 3

[9] *Report* at 3

[10] *Report* at 4 For example, a more recent submission by Denver's technical consultant indicates that Nextel's protection of Denver's five control channels from third-order intermodulation (IM) products was effective at "roughly 18 of the 24 problem sites " There might have been some out of band emissions (OOBE) problems as well, since the Report notes that Nextel installed auto-tune cavity combiners, but this is not discussed in great detail

[11] Comments of Nextel Communication, Inc , filed May 6, 2002, at 20

[12] *Report* at 12

great deal of coordination among Denver, Nextel and the A-band carrier would still be necessary even with rebanding

Interestingly enough, Denver's technical consultant demonstrates, by way of example, that a Nextel frequency at 863 0375 MHz and a cellular frequency at 871.080 MHz could produce a third-order IM product on 854 995 MHz, which would interfere with one of Denver's control channels at 854 9875 MHz.[13] Yet, rebanding would not change this possibility because none of these channels would be relocated under rebanding. Thus, despite the expense and burden of realignment, Denver might still need to turn to local, technical solutions to fix the few remaining situations *which it could just as easily do without realignment* Considering that only five or six locations are still suffering from interference, which Denver's consultant believes could be significantly mitigated through modest changes at the few remaining sites, realignment may not be worth the expense and effort

C Denver's Data Channels in the NPSPAC Band Apparently Have Not Experienced Interference

Denver uses nine channels in the 866-869 MHz band for data services [14] However, neither the June 10, 2003, *Report* nor the more recent *ex parte* presentations filed by Denver's technical consultant make reference to any interference to these data channels.[15] Although all of Denver's data channels are located entirely in the NPSPAC band, Denver has focused its concerns on interference to its voice and control channels, which are largely located in the interleaved portion of the band between 854-861 MHz. For example, the *Report* states, as basic principles, that IM interference from the A-Band cellular operator (in isolation) is most likely to occur in the NPSPAC band (866-869 MHz), and transmitter spurious emissions from A-Band cell sites are most likely to affect NPSPAC channels.[16] The fact that the *Report* makes no mention of interference to Denver's nine data channels in the NPSPAC band seems to belie the *Report*'s major premise that Cellular A-band carriers are a large contributor to Public Safety interference and they are more likely to cause interference to the NPSPAC channels at 866-869 MHz than they are to channels in the interleaved portion of the band

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[13] *Report* at 11

[14] *Report* at 2

[15] See, e g Presentation by Pericle Communications Company, "800 MHz Interference in Denver, CO," dated September 15, 2003, and filed under date of September 17, 2003, by counsel to the City and County of Denver ("September 15 Presentation")

[16] *Report* at 7

D Denver's On-Street Signal Levels Suggest Potential Solutions

The September 15, 2003, presentation from Denver's technical consultant indicates that the "signal on the street" from Denver's radio system is "quite high and nearly uniform, -60 to -80 dBm mostly " However, Denver's technical consultant also points out that because Denver's radio system uses a high site located about 2,500 feet above the city, some "shadowing is present, especially downtown," and the "problem areas usually have a mean signal of -90 to -110 dBm "[17] It would appear from this description that the Denver radio system would benefit from additional repeater sites or signal boosters to improve coverage in some areas, regardless of any need for interference mitigation [18]

E Relatively Minor Changes At Discrete Sites or Even Sectors Can Produce Significant, Immediate, and Verifiable Improvements

The *Report* notes that if the A-Band carrier were to reduce its channel usage by 38% at the five problem sites or even at just specific sectors at these sites, it would create a 92% reduction in harmful IM products [19] While acknowledging that this would impact the cellular carrier's operation, Denver's consultant further notes that "only a handful of sectors in the City and County of Denver are affected, and the number of remaining channels in the set is still large The net effect may be negligible "[20] Southern agrees with the assessment that localized solutions at problem sites or sectors may have only negligable negative impacts but produce tremendously beneficial improvements in interference reduction Moreover, the benefits to the RF environment will be immediate and verifiable, in contrast to Nextel's rebanding proposal which will take years to complete and will not provide any means to verify whether the situation has improved as a direct result of rebanding or just due to improved technology and operating practices

F The Conclusions in Denver's Technical Report Do Not Provide Much Support for Rebanding

In one of its more recent *ex parte* presentations, Denver's technical consultant suggests that rebanding will help in several ways [21] Unfortunately, the experience in Denver does not support these conclusions and the facts would indicate that an

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[17] The *Report* indicates that the main repeater site for the Denver system is located about 12 miles southwest of the downtown area *Report* at 2

[18] According to its September 15 Presentation Denver already uses signal boosters in other areas

[19] *Report* at 12

[20] *Id*

[21] September 15 Presentation

improvement from rebanding will not be nearly as dramatic as Nextel has tried to characterize them Southern offers the following comments on each of the reasons stated by Denver in support of separating Public Safety and cellularized operations:

1 *"Moves NPSPAC channels away from A-Band operator"* Although this would reduce the potential for OOBE interference from the A-Band cellular operator to NPSPAC channels, this has not been identified as a problem in Denver

2 *"Allows vendors to put useful bandpass filters at front-end"* – However, this could very well be a false hope Narrower front-end filters would increase the insertion loss for public safety radios, which would reduce the sensitivity of the radio at all times and thereby reduce Denver's effective coverage Narrower front-ends could also increase the size of the radio

3 *"Creates guard band to minimize number of harmful IM products"* – However, a 2 MHz guardband (from 859-861 MHz) will not reduce the potential for Nextel/A-Band Cellular IM products in the interleaved portion of the band between 854-859 MHz where most of Denver's channels would continue to operate Any future interference will still have to rely on localized technical mitigation techniques

4 *"Makes IM tuning at Nextel sites feasible & practical"* – Under the Consensus Plan, Nextel would vacate 2 MHz of spectrum in the 800 MHz band in Denver, so it is possible Nextel would actually have less flexibility to make frequency changes to avoid harmful IM products. In any event, Nextel has claimed that advance coordination to prevent IM interference is virtually impossible, so the IM tuning benefits of rebanding would only be an after-the-fact interference mitigation technique

5 *"Makes filtering of OOBE at Nextel sites feasible"* – Although Southern does not disagree, it is unclear how much of the problem is due to OOBE and how much is due to IM interference In Denver, for example, it appears that any OOBE problems that might have been present were resolved without the need for rebanding, and that the larger problem was third-order IM which would not be resolved by rebanding.

Conclusion

Southern believes that the City and County of Denver are representative of many parts of the country, in that realignment would be an extraordinarily expensive and burdensome effort that would still leave licensees with the need to implement technical solutions that they could just as effectively implement *without* realignment. Thus, the Commission should not order mandatory, nationwide realignment. Rather, licensees should be given the *option* to engage in voluntary, local frequency swaps as might benefit their specific situations.

Southern is in favor of promptly resolving public safety interference and supports the adoption of a fair and rational solution. The Balanced Approach embodies those ideals. The Consensus Plan, in contrast, would force licensees to implement a tremendously expensive and disruptive nationwide realignment plan that may not even significantly benefit them.

Thank you for your attention to this matter.

Very truly yours,

Christine M. Gill

cc Chairman Michael Powell
Commissioner Kathleen Abernathy
Commissioner Jonathan Adelstein
Commissioner Michael Copps
Commissioner Kevin Martin
John Muleta, Chief, Wireless Telecommunications Bureau
Edmond Thomas, Chief, Office of Engineering & Technology
Sherly Wilkerson
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